REMARKS

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 1-31 are now present in the application. Claims 1 and 26 have been amended. Claims 27-31 have been added. Claims 1 and 14 are independent. Reconsideration of this application, as amended, is respectfully requested.

Claim Rejections Under 35 U.S.C. §§ 102 & 103

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Hansen, U.S. Patent No. 6,135,724. Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Walsh, U.S. Patent No. 3,964,957. Claims 2, 4, 6, 8, 10 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hansen or Walsh in view of Berdan, U.S. Patent No. 3,898,095. Claims 3 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hansen or Walsh in view of Berdan, and further in view of Chu, U.S. Patent No. 6,051,505. Claims 5, 7, 11 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hansen or Walsh in view of Berdan, and further in view of Becker, U.S. Patent No. 6,641,708. Claims 14, 15, 24 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hansen or Walsh in view of Brown, U.S. Patent Application Publication No. US 2003/0209255. Claims 16-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hansen or Walsh in view of Brown, and further in view of Berdan. Claim 25 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hansen or Walsh in view of Brown, and further in view of Dunn, U.S. Patent No. 6,539,963. Claim 23 stands rejected under 35 U.S.C. § 103(a) as

being unpatentable over Hansen or Walsh in view of Brown, and further in view of Erk, U.S. Patent No. 5,593,505. These rejections are respectfully traversed.

Claim 1

In light of the foregoing amendments, Applicants respectfully submit that this rejection has been obviated and/or rendered moot. As the Examiner will note, independent claims 1 has been amended to recite a combination of elements including "a rotatable wafer chuck for holding a wafer non-movable relative to the rotatable wafer chuck during rotation of the rotatable wafer chuck". Support for the above combination of elements is inherently disclosed in the specification and drawings of the instant application. For example, as shown in FIGs. 1 and 3 of the instant application, the wafer 104 is chucked by the wafer chuck so that the wafer can be held vertically without falling down to the tank 112 due to the gravity. Applicants respectfully submit that the above combination of elements as set forth in amended independent claim 1 is not disclosed nor suggested by the references relied on by the Examiner.

Although the Examiner alleged that Hansen in FIG. 8 discloses a rotatable wafer chuck, Applicants respectfully disagree. Hansen merely discloses a multiple stage wet processing chamber including end effectors 152 to hold the wafer (see FIG. 8). However, Hansen nowhere discloses that the end effectors 152 are rotatable. In fact, the actuators 146, 154, and 141 of Hansen are merely used to move the rods 144, 148 in a longitudinal direction and to rotate the tank sections 114a and 128a, respectively. None of these actuators are used to rotate the end effectors 152 (see col. 8, lines 35-61). Therefore, Hansen fails to teach "a rotatable wafer chuck for holding a wafer" as recited in claim 1.

Walsh discloses an apparatus for processing semiconductor wafers including the roller 69 (see FIGs. 2 and 3). Walsh also discloses that the wafer is rotated by the rollers 69 during etching (see col. 6, lines 1-2). In other words, the wafer is rotated relative to the rollers 69 during the rotation of the rollers 69. Therefore, Walsh fails to teach "a rotatable wafer chuck for holding a wafer non-movable relative to the rotatable wafer chuck during rotation of the rotatable wafer chuck" as recited in claim 1.

In addition, Walsh's rollers 69 use grooves 71 to hold the wafer, which would prevent the metal at the edge of the wafer from removal. As shown in FIGs. 4 and 5 of Walsh, the edge of the wafer is inserted into the grooves 71 and therefore the metal layer at the edge of the wafer cannot be removed.

Claim 14

Independent claim 14 recites a combination of steps including "vertically immersing a predetermined portion of the wafer into a chemical bath for etching the metal layer" and "rotating the wafer to remove the metal layer of the predetermined portion from the surface and the edge thereof". Applicants respectfully submit that the above combination of elements as set forth in independent claim 14 is not disclosed nor suggested by the references relied on by the Examiner.

As mentioned, Hansen's end effectors 152 are not rotatable. Therefore, Hansen fails to teach "rotating the wafer to remove the metal layer of the predetermined portion from the surface and the edge thereof". In addition, the wafer in the end effectors 152 has to be entirely immersed into the tank with the etching solution for uniform treatment (see FIG. 2B). Therefore, Hansen

also fails to teach "vertically immersing a predetermined portion of the wafer into a chemical bath for etching the metal layer".

Walsh also fails to cure the deficiencies of Hansen. As shown in FIG 1 of Walsh, the wafer is entirely immersed into the solution to uniformly and precisely treat the surface of the wafer (see also Abstract). Without entirely immersing the wafer into the etching solution, the major purpose of Walsh to obtain a uniform treatment of the wafer surface would be destroyed. Therefore, Walsh also fails to teach "vertically immersing a predetermined portion of the wafer into a chemical bath for etching the metal layer".

With regard to the Examiner's reliance on Brown, Berdan, Chu, Becker, Dunn and Erk, these references have only been relied on for their teachings related to the metal layer on the wafer surface and the subject matter of dependent claims. These references also fail to disclose the above combinations of elements and steps as set forth in independent claims 1 and 14. Accordingly, these references fail to cure the deficiencies of Hansen or Walsh.

Accordingly, none of the references utilized by the Examiner individually or in combination teach or suggest the limitations of independent claims 1 and 14 or their dependent claims. Therefore, Applicants respectfully submit that independent claims 1 and 14 and their dependent claims clearly define over the teachings of the references relied on by the Examiner.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. §§ 102 and 103 are respectfully requested.

Additional Claims

Additional claims 27-31 have been added for the Examiner's consideration.

Dependent claim 27 recites "the rotatable wafer chuck is for holding a backside of the wafer". As mentioned, Walsh rollers 69 hold the wafer by the grooves 71 at the lateral side of the water. Hansen discloses that the wafer is held by the end effectors 152 or the wafer cassette 48. However, Hansen fails to teach that the end effectors 152 or the wafer cassette 48 holds the backside of the wafer. Therefore, Walsh and Hansen fail to teach the above recitation of claim 27.

Dependent claim 28 recites "the step of disposing the wafer on the rotatable wafer chuck includes disposing a backside of the wafer onto the rotatable wafer chuck". As mentioned, Walsh and Hansen fail to teach that the rollers 69 or the end effectors 152 hold the backside of the wafer. Therefore, Walsh and Hansen fail to teach the above recitation of claim 28.

Dependent claim 29 recites "the step of disposing the wafer on the rotatable wafer chuck includes holding the wafer non-movable relative to the rotatable wafer chuck during rotation of the rotatable wafer chuck". As mentioned, Walsh's wafer is rotated relative to the rollers 29. Therefore, Walsh fail to teach the above recitation of claim 29.

Dependent claim 30 recites "the step of rotating the wafer includes rotating a backside of the wafer". Since Hansen's end effectors 152 and wafer are not rotatable and Walsh's wafer is rotated by the rollers 69 at the lateral side of the wafer, Walsh and Hansen fail to teach the above recitation of claim 30.

Dependent claim 31 recites "the step of providing the wafer with the metal layer at least covering the edge thereof includes providing the wafer with the metal layer at least covering a

lateral side edge of the wafer". The Examine has correctly acknowledged that Walsh and Hansen fail to disclose a metal layer on the wafer. Although Brown discloses a copper layer on a front side of the wafer, Brown fails to teach a metal layer covering a lateral side edge of the wafer. Therefore, Brown also fail to teach the above recitation of claim 31.

Favorable consideration and allowance of additional claims 27-31 are respectfully requested.

CONCLUSION

Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but merely to show the state of the prior art, no further comments are necessary with respect thereto.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Joe McKinney Muncy, Registration No. 32,334 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Dated: September 1, 2005

Respectfully submitted,

By _____
Joe McKinney Muncy
Registration No.: 32,334
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Rd
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant

GH